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Applicant : Franz Haas et al.
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DECLARATION OF KARL TIEFENBACHER ACCORDING TO 37 CFR 1.132

Hon. Commissioner for Patents
P.O. Box 1459
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S i r :

In order to assist in the prosecution of this application and the traversal of the rejection of the claims by the Examiner, I, Karl Tiefenbacher do hereby declare as follows:

INTRODUCTION

1. I am a citizen of Austria, and am one of the inventors who with Franz Haas and Johann Haas made the invention of this application.
2. I am trained in chemistry and food technology specializing in bakery technology. I received the degrees of PhD at the University of Vienna (Austria) in 1983. From 1975 - 1988 I

was employed at the "Research Institute of the Austrian Food Industry". Since 1989 I am employed as Scientific Director R&D for the Franz Haas Group.

3. I am the inventor or a co-inventor of US Patents 6,187,363, 6,146,573, 5,711,908, 5,576,049, and 5,376,320 among others.
4. I have read the specification and claims of this application and the Office Action dated September 3, 2004 in which claims 36-59 were rejected as unpatentable over Kim patent 4,442,192 and Kondo abstract of Japanese specification 0131 312960-A. A detailed analysis of the references together with arguments explaining why the present claims are believed to define subject matter that is not taught or suggested by the references is being submitted separately. Here, I propose to supplement that submission with a brief discussion of the importance of plasticization in the production of the kind of baking mixtures and baked goods of concern, and to provide evidence that the claimed baking mixtures and baked products differ qualitatively and quantitatively from the products of the prior art while satisfying commercial requirements for processing and handling conditions as well as meeting consumer expectations of product consistency and taste.

THE CONTRIBUTION OF PLASTICIZATION TO THE BAKING PROCESS

As stated in the specification at page 8, line 3, to page 9 line 2, page 16, lines 4-20 and in the working examples, and claimed in independent claims 36, 46, and 51, the present invention provides a baking mixture such as batter or dough for baking particular kinds of non-perishable baked goods made

from flours and/or starches and having certain combinations of physical properties that those skilled in the art were not previously able to achieve.

The particular non-perishable baked goods under consideration are those that are shaped in a plastic condition when still hot from the baking process or when reheated to return to plastic condition, for example by a wrapping, rolling, pressing, stamping, embossing, bending, folding or deep drawing operation to afford the desired crispy-brittle shaped product. Successful accomplishment of each of these operations, in turn, has hitherto required the use of baking mixtures from a limited range of compositions. Baking mixtures of other compositions are unsuitable for commercial manufacture, wasteful in operation, or fail entirely to produce the desired result.

The manufacture of the particular baked goods under consideration proceeds in three steps:

- (a) first, a baking step produces a baked substantially planar intermediate product capable of being reshaped while hot and not very stable in form
- (b) next, the intermediate product is mechanically reshaped into a different three-dimensional form
- (c) finally, the reshaped intermediate is cooled so that it retains its new shape while giving up its plastic reshapability and solidifies to a crispy-brittle baked product.

Hitherto, such processes have worked only with baking mixtures having a particularly high content of sugar. Water present in the baking mixture acts as plasticizer but is volatilized away during the baking step (see specification at page 1-2). Hence, only the finely dispersed molten sugar resulting from the baking step plasticizes the baked product to impart the essential ability to be reshaped in the second step. This ability to be reshaped is absent without the high content of finely dispersed molten sugar in the baked product. This high sugar content represents a plasticizing agent activated by the heat of the baking process and effective only while hot, so that on cooling the mechanically reshaped intermediate the plasticizing effect disappears as the finely dispersed molten sugar solidifies to a glass or crystallizes and the product is fixed in its desired new shape.

PLASTICIZATION BY SUGAR AS A FUNCTION OF SUGAR LEVEL IN THE MIXTURE

Several disadvantages are associated with the use of unshaped baking mixtures with high sugar content as plasticizing agent for the baked product resulting from the baking process.

With baking mixtures with only a few per cent sugar content, there is the danger that the resulting baked product is very sticky at the end of the baking process and hence does not completely detach from the baking surfaces when the mold is opened, so that the baked product adhering to the baking surfaces is damaged upon opening the mold.

In the usual baking molds for wafers, in which flat wafer sheets, wafer cones, flat or deep wafer cups, and flat or deep

wafer plates receive their final shapes, there are therefore used only sugar-free baking mixtures or baking mixtures with a very low sugar content.

Even with a very low sugar content in the baking mixture it is necessary to use a special anti-adhesion stratum on the baking surfaces or to have specific provisions in the recipe in order to assure that the baked product of the baking process adhering to the baking surfaces of the mold detaches and is not distorted or even destroyed.

With the appreciably higher sugar content in the baking mixture that affords a plasticizing agent when hot, the baked intermediate made from this mixture is very sticky on top and on the bottom. It must therefore be mechanically removed from the baking surface on which it was made and to which it adheres strongly. Hence production of such sticky baked products is only possible in special baking machines, in which the baking surfaces on which the sticky baked products have been made are freely accessible after the baking operation to flat mechanically acting take-off knives etc..

The particular non-perishable baked goods specified above are therefore produced in specialized baking machines from baking mixtures having a very high sugar content effective as plasticizing agent when hot, such as individual flat wafer sheets or continuous flat wafer belts, to be shaped or mechanically reshaped after baking while in a warm, plastic condition by wrapping, rolling, pressing, stamping, embossing, bending, folding or deep drawing to afford mini-rolls, cones, flat or deep plates, flat or deep cups etc..

The products of mechanically reshaping wafer sheets and wafer

belts in a warm plastic condition are allowed to cool to room temperature in their new 3-dimensional shape to eliminate the plasticizing effect of the finely dispersed sugar and the reshaping ability of the goods, and allow the latter to solidify to a crispy-brittle structure that retains its shape.

The reshapeable flat or strip-like wafer pieces are, before or immediately after reshaping, accessible to impregnation or coating, by which, for instance, their permeation behavior or sealing behavior can be modified or their taste modified.

PLASTICIZING EFFECT OF ERYTHRITOL AND XYLITOL IN BAKING MIXTURES

As found according to this invention, in the baking mixtures of interest erythritol and xylitol are more efficient plasticizers than sugar, i.e. more plasticizing effect by a given weight concentration of erythritol and/or xylitol than the plasticizing effect of the same weight concentration of sugar. Hence, the use of erythritol and/or xylitol at concentrations of only a few percent (based on flours and/or starches) unexpectedly gives advantages for the production, since the degree of sweetness of the product can be specifically reduced.

In addition, by means of the better plasticizing action of erythritol and/or xylitol, the water concentration required for a defined viscosity can be reduced. As a result, with increasing concentration of the polyols, less energy is therefore consumed, the baking time required is decreased and thus the output is increased.

In my experience of the production of wafer rolls 9 mm in diameter and 90 mm long using a machine type EWB (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) such wafer rolls have been customarily produced having a sugar level in the range from 50 to over 100% by weight (calculated on the basis of flours and/or starches), preferably 60 - 80% by weight and therefore have an intensively sweet taste.

Partial replacement of sugar according to the invention by reduced levels of erythritol as in 45, 30 and 20 parts by weight of sugar with 5, 12, and 18 parts of erythritol respectively has afforded fully acceptable commercial products with satisfactory handling and processing properties in production and brittle crispy consistency and taste satisfying consumers' wishes.

Complete replacement of sugar according to the invention by reduced levels of erythritol and/or xylitol, as with 26 parts by weight of erythritol or with a combination of 10 parts by weight of erythritol and 20 parts by weight of xylitol, has afforded fully acceptable commercial products having satisfactory handling and processing properties in production and brittle crispy consistency and tasting neutral, not sweet, with a rounded flavor typical of cereals.

I have found that complete replacement of sugar according to the invention by reduced levels of erythritol and/or xylitol is effective over a range of proportions of erythritol and/or xylitol calculated as percent of flour and/or starch, bounded at the lower end of the range by insufficient plasticization of too little is used and at the upper end of the range by excessive plasticization giving softer products than desired.

Thus recipes including 23 parts by weight and 50 parts by weight of erythritol respectively are still within but close to the boundaries of the effective range.

Similarly, I have found production of rolled wafers approximately 20 mm in diameter and 45 mm long in baking molds of type TRO (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) with partial and complete replacement of sugar by erythritol and/or xylitol, production of rolled sugar cones with partial and complete replacement of sugar by erythritol and/or xylitol, and production of deep-drawn, cup-shaped hollow bodies with partial and complete replacement of sugar by erythritol and/or xylitol feasible according to this invention with commercially acceptable results.

SUMMARY AND ACKNOWLEDGMENT

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE AND DATE SIGNED


Karl Effenbather

Date: Nov. 30, 2004